A MAPPING FROM THE HUMAN FACTORS ANALYSIS AND CLASSIFICATION SYSTEM (DOD-HFACS) TO THE DOMAINS OF HUMAN SYSTEMS INTEGRATION (HSI)

Technical Report

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This technical report is part of the research efforts to improve human systems integration (HSI) in the systems engineering (SE) technical processes. It documents the mapping of human error codes used in accident investigations with teh established domains of HSI. This will enable the application of legacy mishap data to new system design.

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Table of Contents

Page

Table of Contents 2

Introduction 3

Human Systems Integration 3
- Manpower 5
- Personnel 5
- Training 5
- Human Factors 5
- System Safety 6
- Survivability 6
- Health 6
- Habitability 6
- Environment 7

The Human Factors Analysis and Classification System 7

Mapping of DoD-HFACS to HSI Domains 9

Conclusion 13

Attachment 1: DoD-HFACS Code Definitions 14

References 37

Introduction

This technical report is part of the research efforts to improve human systems integration (HSI) in the systems engineering (SE) technical processes. It documents the mapping of human error codes used in accident investigations with the established domains of HSI. This will enable the application of legacy mishap data to new system design.

Human Systems Integration

Human systems integration, as defined by INCOSE, is "the interdisciplinary technical and management processes for integrating human considerations within and across all system elements; an essential enabler to systems engineering practice" (INCOSE, 2007). HSI is concerned with providing methods and tools that support the SE community by ensuring humans are considered throughout the systems development process in a logical and effective way (Pew & Mavor, 2007). The US Air Force recognizes nine distinct domains of HSI as shown in Figure 1 (AIRPRINT, 2005). Systems engineers do not replace the disparate organizations of each domain, but they must effectively interact with them.

Figure 1. HSI Domains
(AIRPRINT, 2005)

The sections that follow discuss the HSI domains in greater detail. There is no universal agreement as to the delineation of domains. As it can be seen in Table 1, while there is general agreement over the original domains of manpower, personnel, training, and human factors, some communities have recently added domains that have not been fully embraced by the rest.

Table 1. Domains of HSI

HSI Domains	AIRPRINT AFRL/RH	INCOSE	Defense Acquisition Guide	MANPRINT	IEEE SMC	ACM	UK HFI Program
Manpower	X	X	X	X	X	X	X
Personnel	X	X	X	"Personal Capabilities"	X	X	X
Training	X	X	X	X	X	X	X
Human Factors	X	"HFE"	X	"HFE"	X	X	Ergonomics
Safety	X	X	"Safety and Occupational Health"	X		X	X
Health	X	"Occupational Health"		X			X
Survivability	X	X	"Personnel Survivability"	X			
Habitability	X	X	X				
Environment	X	X					

Sources: (ACM, 2006; AIRPRINT, 2005; Booher, 2003; DAU, 2006; HFIDTC, 2006; INCOSE, 2007; ISO/IEC, 2007)

Though there is no universally accepted set of definitions, there is much in common among the definitions found in current literature. The definitions that follow are written in terms that enable a system engineer to delineate system requirements by domain and to perform tradeoff analysis between domains. While these are original, they draw heavily from the definitions put forth by INCOSE, and the Human Effectiveness Directorate of the Air Force Research Laboratory (AFRL) (AIRPRINT, 2005; INCOSE, 2007).

Manpower

The manpower domain determines the number and type of personnel required to operate and support a system. Support includes functions such as maintenance, sustainment, and training. Many civilian organizations call this *human resources*.

DoD direction on manpower estimates for major defense acquisition programs is extensive. Program managers must coordinate with the manpower community, and the final manpower estimate is reviewed by the Under Secretary of Defense for Personnel and Readiness (DoD, 1999).

Personnel

The personnel domain determines the knowledge, skills, and abilities and the physical, cognitive and sensory capabilities required of the humans in the system. The personnel community defines these parameters for the system and determines how to best obtain and maintain an adequate pool of qualified persons. The U.S. Army calls it *personal capabilities* and it is related to *human resources* in civilian organizations.

Training

The training domain determines the necessary infrastructure and system components to provide system personnel with the requisite attributes for optimal system performance. This includes individual and unit training programs, training systems, and retraining schedules.

Human Factors

The human factors domain addresses how to incorporate human characteristics and limitations into system design for optimal usability. The issues of this domain are often divided into the following categories:

Cognitive— response times, level of autonomy, cognitive workload limitations

Physical— ergonomic control design, anthropomorphic accommodation, workload limitations

Sensory— perceptual capabilities, such as sight, hearing, or tactile

Team dynamic— communication and delegation, task sharing, crew resource management

Much of U.S. industry calls this "human factors engineering (HFE)" and European and Asian organizations generically refer to it as "ergonomics". The methods and tools of this domain are the most mature of all the HSI domains.

System Safety

The system safety domain evaluates the characteristics and procedures of systems in order to minimize the potential for accidents. Safety studies affect system design by advocating features that eliminate hazards when possible and manage them when they cannot be avoided. Such features include sub-systems for: system status, alert, backup, error recovery, and environmental risk.

Survivability

The survivability domain evaluates the characteristics and procedures of systems that can reduce the probability of attack or fratricide, as well as minimizing system damage and injury if attacked.

Health

The health domain evaluates the characteristics and procedures of systems that create significant risks of injury or illness to humans. Sources of health hazards include: noise, temperature, humidity, CBRNE (i.e.: chemical, biological, radiological, nuclear, and explosive) substances, physical trauma, and electric shock.

Habitability

The habitability domain evaluates the characteristics and procedures of systems that have a direct impact on personnel effectiveness by maintaining morale, comfort, and quality of life. These characteristics uniquely include: climate control, space layout, and support services.

Environment

The Environment domain evaluates the system in the medium for operation. Consideration is made to protect the environment from system manufacturing, operations, sustainment, and disposal activities. In some communities this domain is not considered part of HSI, but rather of systems engineering as a whole.

The Human Factors Analysis and Classification System

Accident investigations have grown much more sophisticated in recent years, and investigators now have a greater understanding of human error. Instead of being seen as the root cause, "human error" is now viewed as the beginning of a study into the human-machine interaction breakdown. A mishap is characterized as a sum of latent failures. The investigation begins with the active failures and then looks for latent conditions and latent factors in the environment. In aviation, this has spawned a theoretically-derived human error framework called the Human Factors Analysis and Classification System (HFACS). Since fiscal year (FY) 2004 the DoD safety community has implemented an HFACS-based taxonomy for use in its aviation accident investigation process (Musselman, 2009). As Figure 2 shows, the DoD-HFACS identifies four tiers of active failures and latent conditions: Acts, Preconditions, Supervision, and Organization. These are then decomposed into categories and then specific sub-codes (AFSC, 2007). For a complete listing of the currently 147 DoD-HFACS codes and their definitions, refer to Appendix A.

HFACS has been used to study mishaps across all branches of the military (Thompson, Tvaryanas, & Constable, 2005), in commercial aviation (Li, 2006; Wiegmann & Shappell, 2001), and in multiple recent UAV studies (Thompson et al., 2005; Tvaryanas, 2006; Williams, 2006). HFACS has also been used to quantify human contributions in maritime shipping accidents (Celik & Cebi,

2009). In all of this, HFACS has been demonstrated to have a high level of external validity (Shappell, Detwiler, Holcomb, Hackworth, & Wiegmann, 2007).

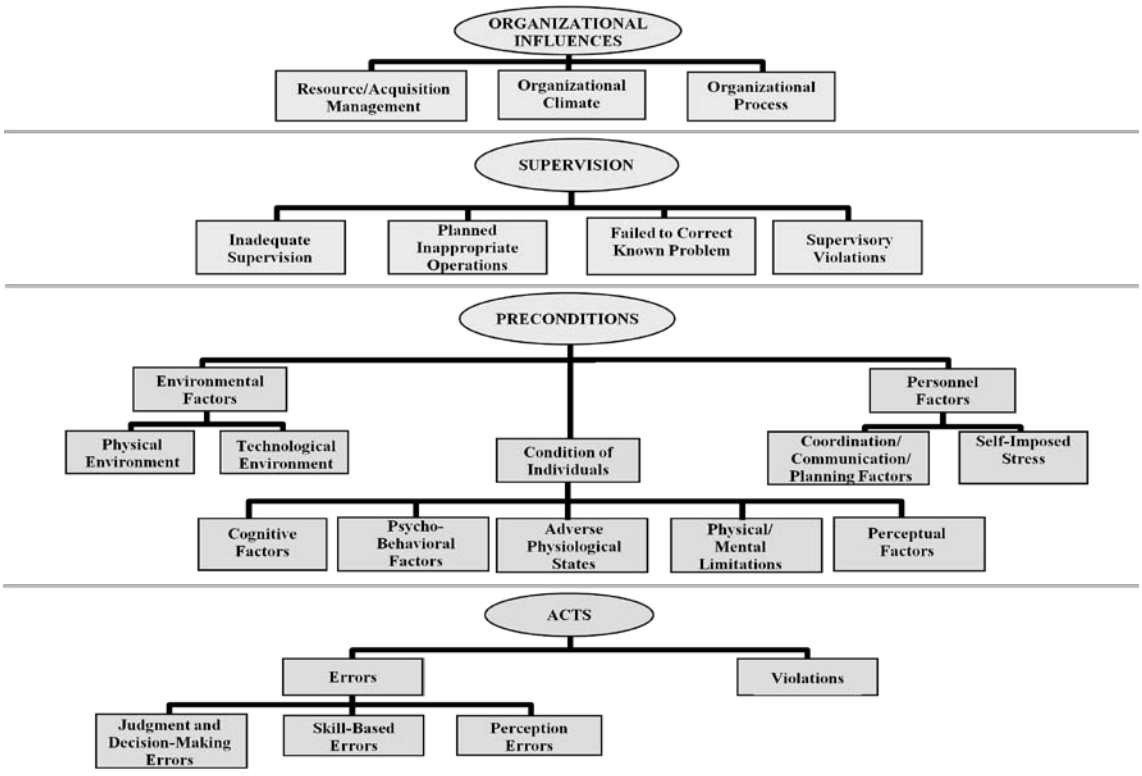

Figure 2. DoD Human Factors Analysis and Classification System (AFSC, 2007)

Mapping of DoD-HFACS to HSI Domains

Table 2 is the mapping of all codes in the DoD-HFACS to the related domains of HSI. This is the result of interviews and feedback from multiple professionals in both the accident investigation and systems engineering profession. When investigators use HFACS, they are asking what happened. They include an HFACS code if it was determined to be causal or contributory to the mishap events. Systems engineers are asking what is most important for system development. They related to the HSI domains based on the significance of their contribution to the unique issues of the new system. This mapping will facilitate the exchange of information from legacy mishaps to new system designs.

Table 2. Mapping of DoD-HFACS to the Domains of HSI

HFACS Code	Title	Manpower	Personnel	Training	Human Factors	Safety	Health	Habitability
AE101	Inadvertent Operation				x	x		
AE102	Checklist Error			x	x	x		
AE103	Procedural Error			x	x	x		
AE104	Overcontrol/Undercontrol			x	x			
AE105	Breakdown in Visual Scan				x			
AE106	Inadequate Anti-G Straining Maneuver		x	x	x	x	x	
AE201	Risk Assessmnent – During Operation		x	x				
AE202	Task Misprioritization		x	x	x			
AE203	Necessary Action – Rushed		x	x	x			
AE204	Necessary Action – Delayed		x	x	x			
AE205	Caution/Warning – Ignored		x	x	x	x		
AE206	Decision Making During Operation		x	x	x			
AE301	Error due to Misperception		x		x	x		
AV001	Violation - Based on Risk Assessment		x	x				
AV002	Violation - Routine/Widespread					x		
AV003	Violation - Lack of Discipline		x					
PE101	Vision Restricted by Icing/Windows Fogged/Etc.				x	x		
PE102	Vision restricted by Meteorological Conditions				x	x		
PE103	Vibration					x	x	x
PE104	Vision Restricted in Workplace by Dust/Smoke/Etc.					x	x	

HFACS Code	Title	Manpower	Personnel	Training	Human Factors	Safety	Health	Habitability
PE105	Windblast					x	x	x
PE106	Thermal Stress – Cold					x	x	x
PE107	Thermal Stress – Heat					x	x	x
PE108	Manuevering Forces – In-Flight					x	x	
PE109	Lightning of Other Aircraft/Vehicle				x			
PE110	Noise Interference				x	x	x	x
PE111	Brownout/Whiteout				x	x		
PE201	Seating and Restraints				x	x		x
PE202	Instrumentation and Sensory Feedback Systems				x	x		
PE203	Visibility Restrictions				x	x		
PE204	Controls and Switches				x	x		
PE205	Automation				x	x		
PE206	Workspace Incompatible with Human					x	x	x
PE207	Personal Equipment Interference				x	x	x	x
PE208	Communications – Equipment				x	x		
PC101	Inattention				x			x
PC102	Channelized Attention			x	x			
PC103	Cognitive Task Oversaturation		x	x	x			
PC104	Confusion		x	x	x			
PC105	Negative Transfer			x	x			
PC106	Distraction				x	x		
PC107	Geographic Misorientation (Lost)			x	x			
PC108	Checklist Interference				x	x		
PC201	Pre-Exisiting Personality Disorder		x					
PC202	Pre-Existing Psychological Disorder		x					
PC203	Pre-Existing Psychosocial Disorder		x					
PC204	Emotional State		x	x				
PC205	Personality Style		x					
PC206	Overconfidence		x	x				
PC207	Pressing		x	x				
PC208	Complacency		x					
PC209	Inadequate Motivation		x					
PC210	Misplaced Motivation		x	x				
PC211	Overaggressive		x					
PC212	Excessive Motivation to Succeed		x	x				
PC213	Get-Home-It is/Get-There-It is		x	x				
PC214	Response Set		x	x				
PC215	Motivational Exhaustion (Burnout)	x						
PC301	Effects of G-forces (G-LOC,				x		x	

HFACS Code	Title	Manpower	Personnel	Training	Human Factors	Safety	Health	Habitability
	etc.)							
PC302	Prescribed Drugs						x	
PC303	Operational Injury/Illness						x	x
PC304	Sudden Incapacitation/Unconsciousness						x	
PC305	Pre-Exisiting Physical Illness/Injury/Deficit		x					
PC306	Physical Fatigue (Overexertion)	x	x		x			
PC307	Fatigue – Physiological/Mental	x	x					
PC308	Circadian Rhthym Desynchrony	x						
PC309	Motion Sickness		x		x			
PC310	Trapped Gas Disorder						x	x
PC311	Evolved Gas Disorder						x	x
PC312	Hypoxia				x	x	x	
PC313	Hyperventilation		x					
PC314	Visual Adaptation		x			x	x	
PC315	Dehydration							x
PC316	Physical Task Oversaturation	x	x					
PC401	Learning/Ability/Rate		x					
PC402	Memory Ability/Lapses		x					
PC403	Anthropometric/Biomechanical Limitations		x					
PC404	Motor Skills/Coordination or Timing Deficiency		x					
PC405	Technical/Procedural Knowledge		x					
PC501	Illusion – Kinesthetic				x			
PC502	Illusion – Vestibular				x			
PC503	Illusion – Visual				x			
PC504	Misperception of Operational Conditions				x			
PC505	Misinterpreted/Misread Instrument				x	x		
PC506	Expectancy				x			
PC507	Auditory Cues				x			
PC508	Spatial Disorientation 1 Unrecognized				x			
PC509	Spatial Disorientation 2 Recognized				x			
PC510	Spatial Disorientation 3 Incapacitating				x			
PC511	Temporal Distortion				x			
PP101	Crew/Team Leadership			x				
PP102	Cross-Monitoring Performance			x	x			
PP103	Task Delegation			x				
PP104	Rank/Position Authority Gradient	x						
PP105	Assertiveness			x				
PP106	Communicating Critical			x	x			

HFACS Code	Title	Manpower	Personnel	Training	Human Factors	Safety	Health	Habitability
	Information							
PP107	Standard/Proper Terminology			x				
PP108	Challenge and Reply			x				
PP109	Mission Planning			x	x			
PP110	Mission Briefing			x				
PP111	Task/Mission-In-Progress Re-Planning			x	x			
PP112	Miscommunication			x	x			
PP201	Physical Fitness		x					
PP202	Alcohol					x		
PP203	Drugs/Supplements/Self Medication					x		
PP204	Nutrition		x					
PP205	Inadequate Rest					x		
PP206	Unreported Disqualifying Medical Condition		x			x		
SI001	Leadership/Supervision/Oversight Inadequate	x	x	x				
SI002	Supervision – Modeling		x	x				
SI003	Local Training Issues/Programs			x				
SI004	Supervision – Policy					x		
SI005	Supervision – Personality Conflict		x					
SI006	Supervision – Lack of Feedback					x		
SP001	Ordered/Led on Mission Beyond Capability		x	x				
SP002	Crew/Team/Flight Makeup/Composition	x	x					
SP003	Limited Recent Experience		x	x				
SP004	Limited Total Experience		x	x				
SP005	Proficiency			x				
SP006	Risk Assessment – Formal				x			
SP007	Authorized Unnecessary Hazard					x		
SF001	Personnel Management			x		x		
SF002	Operations Management					x		
SV001	Supervision – Discipline Enforced					x		
SV002	Supervision – De facto Policy					x		
SV003	Directed Violation					x		
SV004	Currency			x				
OR001	Air Traffic Control Resources				x	x		
OR002	Airfield Resources				x	x		
OR003	Operator Support							x
OR004	Acquisition Polies/Design Processes					x		
OR005	Attrition Policies					x		
OR006	Accession/Selection Policies		x					
OR007	Personnel Resources	x	x					

HFACS Code	Title	Manpower	Personnel	Training	Human Factors	Safety	Health	Habitability
OR008	Informational Resources/Support	x		x	x			
OR009	Financial Resources/Support					x		
OC001	Unit/Organizational Values/Culture		x	x				
OC002	Evaluation Promotion/Upgrade		x					
OC003	Perceptions of Equipment			x	x			
OC004	Unit Msn/AC/ Vehicle/Equip Change or Unit Deactivation	x	x	x	x			
OC005	Organizational Structure					x		
OP001	Ops Tempo/Workload	x	x		x			
OP002	Program and Policy Risk Assessment					x		
OP003	Procedural Guidance/Publications			x				
OP004	Organizational Training Issues/Programs			x				
OP005	Doctrine					x		
OP006	Program Oversight/Program Management					x		

Conclusion

Researchers have established the importance of designing systems with the human components in mind. To do this, engineers must ensure to elicit and prioritize requirements related to the human components of the system early in system development. This mapping allows for an empirical study of legacy system mishaps involving human error as a causal factor. By applying this mapping to HSI domains, we can begin to bridge the work of the safety community with the systems engineering processes.

Attachment 1: DoD-HFACS Code Definitions

This attachment contains the complete description of the DoD-HFACS taxonomy

Src: Air Force Safety Center, (Musselman, 2009).

DoD HFACS Codes

Acts

Are those factors that are most closely tied to the mishap, and can be described as active failures or actions committed by the operator that result in human error or unsafe situation.

Errors (AExxx)

Are factors in a mishap when mental or physical activities of the operator fail to achieve their intended outcome as a result of skill-based, perceptual, or judgment and decision making errors leading to an unsafe situation. Errors are unintended.

Skill-Based Errors (AE1xx)

Are factors in a mishap when errors occur in the operator's execution of a routine, highly practiced task relating to procedure, training or proficiency and result in an unsafe a situation.

AE101 Inadvertent Operation

Inadvertent Operation is a factor when individual's movements inadvertently activate or deactivate equipment, controls or switches when there is no intent to operate the control or device. This action may be noticed or unnoticed by the individual.

AE102 Checklist Error

Checklist Error is a factor when the individual, either through an act of commission or omission makes a checklist error or fails to run an appropriate checklist and this failure results in an unsafe situation.

AE103 Procedural Error

Procedural Error is a factor when a procedure is accomplished in the wrong sequence or using the wrong technique or when the wrong control or switch is used. This also captures errors in navigation, calculation or operation of automated systems.

AE104 Overcontrol/ Undercontrol

Overcontrol/Undercontrol is a factor when an individual responds inappropriately to conditions by either overcontroling or undercontroling the aircraft/vehicle/system. The error may be a result of preconditions or a temporary failure of coordination.

AE105 Breakdown in Visual Scan

Breakdown in Visual Scan is a factor when the individual fails to effectively execute learned / practiced internal or external visual scan patterns leading to unsafe situation.

AE106 Inadequate Anti-G Straining Maneuver

Inadequate Anti-G Straining Maneuver is a factor when the individuals AGSM is improper, inadequate, poorly timed or non-existent and this leads to adverse neurocirculatory effects.

Judgment and Decision-Making Errors (AE2xx)

Are factors in a mishap when behavior or actions of the individual proceed as intended yet the chosen plan proves inadequate to achieve the desired end-state and results in an unsafe situation.

AE201 Risk Assessment – During Operation

Risk Assessment – During Operation is a factor when the individual fails to adequately evaluate the risks associated with a particular course of action and this faulty evaluation leads to inappropriate decision and subsequent unsafe situation. This failure occurs in real-time when formal risk-assessment procedures are not possible.

AE202 Task Misprioritization

Task Misprioritization is a factor when the individual does not organize, based on accepted prioritization techniques, the tasks needed to manage the immediate situation.

AE203 Necessary Action – Rushed

Necessary Action – Rushed is a factor when the individual takes the necessary action as dictated by the situation but performs these actions too quickly and the rush in taking action leads to an unsafe situation.

AE204 Necessary Action – Delayed

Necessary Action – Delayed is a factor when the individual selects a course of action but elects to delay execution of the actions and the delay leads to an unsafe situation.

AE205 Caution/Warning – Ignored

Caution/Warning – Ignored is a factor when a caution or warning is perceived and understood by the individual but is ignored by the individual leading to an unsafe situation.

AE206 Decision-Making During Operation

Decision-Making During Operation is a factor when the individual through faulty logic selects the wrong course of action in a time-constrained environment.

Perception Errors (AE3xx)

Are factors in a mishap when misperception of an object, threat or situation, (such as visual, auditory, proprioceptive, or vestibular illusions, cognitive or attention failures, etc), results in human error.

AE301 Error due to Misperception

Error due to Misperception is a factor when an individual acts or fails to act based on an illusion; misperception or disorientation state and this act or failure to act creates an unsafe situation.

Violations (AVxxx)

Are factors in a mishap when the actions of the operator represent willful disregard for rules and instructions and lead to an unsafe situation. Violations are deliberate.

AV001 Violation - Based on Risk Assessment

Violation- Based on Risk Assessment is a factor when the consequences/risk of violating published procedures was recognized, consciously assessed and honestly determined by the individual, crew or team to be the best course of action. Routine "work-arounds" and unofficial procedures that are accepted by the community as necessary for operations are also captured under this code.

AV002 Violation - Routine/Widespread

Violation - Routine/Widespread is a factor when a procedure or policy violation is systemic in a unit/setting and not based on a risk assessment for a specific situation. It needlessly commits the individual, team, or crew to an unsafe course-of-action. These violations may have leadership sanction and may not routinely result in disciplinary/administrative action. Habitual violations of a single individual or small group of individuals within a unit can constitute a routine/widespread violation if the violation was not routinely disciplined or was condoned by supervisors. These violations may also be referred to as "Routine Violations."

AV003 Violation - Lack of Discipline

Violation - Lack of Discipline is a factor when an individual, crew or team intentionally violates procedures or policies without cause or need. These violations are unusual or isolated to specific individuals rather than larger groups. There is no evidence of these violations being condoned by leadership. These violations may also be referred to as "exceptional violations." (NOTE: These violations may also carry UCMJ consequences. Boards should consult the Judge Advocate of the convening authority.)

Preconditions

Are factors in a mishap if active and/or latent preconditions such as conditions of the operators, environmental or personnel factors affect practices, conditions or actions of individuals and result in human error or an unsafe situation.

Environmental Factors (PExxx)

Are factors in a mishap if *physical* or *technological* factors affect practices, conditions and actions of individual and result in human error or an unsafe situation.

Physical Environment (PE1xx)

Are factors in a mishap if environmental phenomena such as weather, climate, white out or brown out conditions affect the actions of individuals and result in human error or an unsafe situation.

PE101 Vision Restricted by Icing/Windows Fogged/Etc

Vision Restricted by Icing/Windows Fogged/Etc is a factor when it is determined by the investigator that icing or fogging of the windshield/windscreen or canopy restricted the vision of the individual to a point where normal duties were affected.

PE102 Vision Restricted by Meteorological Conditions

Vision Restricted by Meteorological Conditions is a factor when weather, haze, or darkness restricted the vision of the individual to a point where normal duties were affected.

PE103 Vibration

Vibration is a factor when the intensity or duration of the vibration is sufficient to cause impairment of vision or adversely effect the perception of orientation.

PE104 Vision Restricted in Workspace by Dust/Smoke/Etc.

Vision restricted in workspace by dust/smoke/etc. is a factor when dust, smoke, etc. inside the cockpit, vehicle or workstation restricted the vision of the individual to a point where normal duties were affected.

PE105 Windblast

Windblast is a factor when the individual's ability to perform required duties is degraded during or after exposure to a windblast situation.

PE106 Thermal Stress – Cold

Thermal Stress – Cold is a factor when the individual is exposed to cold resulting in compromised function.

PE107 Thermal Stress – Heat

Thermal Stress – Heat is a factor when the individual is exposed to heat resulting in compromised function.

PE108 Maneuvering Forces – In-Flight

Maneuvering Forces – In-Flight is a factor when acceleration forces of longer than one second cause injury, prevent or interfere with the performance of normal duties. Do not use this code to capture G-induced loss of consciousness.

PE109 Lighting of Other Aircraft/Vehicle

Lighting of Other Aircraft/Vehicle is a factor when the absence, pattern, intensity or location of the lighting of other aircraft/vehicle prevents or interferes with safe task accomplishment.

PE110 Noise Interference

Noise Interference is a factor when any sound not directly related to information needed for task accomplishment interferes with the individual's ability to perform that task.

PE111 Brownout/Whiteout

Brownout/Whiteout is a factor when dust, snow, water, ash or other particulates in the environment are disturbed by the aircraft, vehicle or person and cause a restriction of vision to a point where normal duties are affected

Technological Environment (PE2xx)

Are factors in a mishap when cockpit / vehicle / control station / workspace design factors or automation affect the actions of individuals and result in human error or an unsafe situation.

PE201 Seating and Restraints

Seating and Restraints is a factor when the design of the seat or restraint system, the ejection system, seat comfort or poor impact-protection qualities of the seat create an unsafe situation.

PE202 Instrumentation and Sensory Feedback Systems

Instrumentation and Sensory Feedback Systems is a factor when instrument factors such as design, reliability, lighting, location, symbology or size are inadequate and create an unsafe situation. This includes NVDs, HUD, off-bore-site and helmet-mounted display systems and inadequacies in auditory or tactile situational awareness or warning systems such as aural voice warnings or stick shakers.

PE203 Visibility Restrictions

Visibility Restrictions is a factor when the lighting system, windshield / windscreen / canopy design, or other obstructions prevent necessary visibility and create an unsafe situation. This includes glare or reflections on the canopy / windscreen / windshield. Visibility restrictions due to weather or environmental conditions are captured under PE101 or PE102.

PE204 Controls and Switches

Controls and Switches is a factor when the location, shape, size, design, reliability, lighting or other aspect of a control or switch is inadequate and this leads to an unsafe situation.

PE205 Automation

Automation is a factor when the design, function, reliability, use guidance, symbology, logic or other aspect of automated systems creates an unsafe situation.

PE206 Workspace Incompatible with Human

Workspace Incompatible with Human is a factor when the workspace is incompatible with the mission requirements and mission safety for this individual.

PE207 Personal Equipment Interference

Personal Equipment Interference is a factor when the individual's personal equipment interferes with normal duties or safety.

PE208 Communications – Equipment

Communications - Equipment is a factor when comm. equipment is inadequate or unavailable to support mission demands. (i.e. aircraft/vehicle with no intercom) This includes electronically or physically blocked transmissions. Communications can be voice, data or multi-sensory.

Condition of Individuals (PCxxx)

Are factors in a mishap if cognitive, psycho-behavioral, adverse physical state, or physical/mental limitations affect practices, conditions or actions of individuals and result in human error or an unsafe situation.

Cognitive Factors (PC1xx)

Are factors in a mishap if cognitive or attention management conditions affect the perception or performance of individuals and result in human error or an unsafe situation.

PC101 Inattention

Inattention is a factor when the individual has a state of reduced conscious attention due to a sense of security, self-confidence, boredom or a perceived absence of threat from the environment which degrades crew performance. (This may often be a result of highly repetitive tasks. Lack of a state of alertness or readiness to process immediately available information.)

PC102 Channelized Attention

Channelized Attention is a factor when the individual is focusing all conscious attention on a limited number of environmental cues to the exclusion of others of a subjectively equal or higher or more immediate priority, leading to an unsafe situation. May be described as a tight focus of attention that leads to the exclusion of comprehensive situational information.

PC103 Cognitive Task Oversaturation

Cognitive Task Oversaturation is a factor when the quantity of information an individual must process exceeds their cognitive or mental resources in the amount of time available to process the information.

PC104 Confusion

Confusion is a factor when the individual is unable to maintain a cohesive and orderly awareness of events and required actions and experiences a state characterized by bewilderment, lack of clear thinking, or (sometimes) perceptual disorientation.

PC105 Negative Transfer

Negative Transfer is a factor when the individual reverts to a highly learned behavior used in a previous system or situation and that response is inappropriate or degrades mission performance.

PC106 Distraction

Distraction is a factor when the individual has an interruption of attention and/or inappropriate redirection of attention by an environmental cue or mental process that degrades performance.

PC107 Geographic Misorientation (Lost)

Geographic Misorientation (Lost) is a factor when the individual is at a latitude and/or longitude different from where he believes he is or at a lat/long unknown to the individual and this creates an unsafe situation.

PC108 Checklist Interference

Checklist Interference is a factor when an individual is performing a highly automated/learned task and is distracted by anther cue/event that results in the interruption and subsequent failure to complete the original task or results in skipping steps in the original task.

Psycho-Behavioral Factors (PC2xx)

Are factors when an individual's personality traits, psychosocial problems, psychological disorders or inappropriate motivation creates an unsafe situation.

PC201 Pre-Existing Personality Disorder

Pre-existing Personality Disorder is a factor when a qualified professional determines the individual met Diagnostic and Statistical Manual criteria for a personality disorder.

PC202 Pre-Existing Psychological Disorder

Pre-existing Psychological Disorder is a factor when a qualified professional determines the individual met Diagnostic and Statistical Manual criteria for a psychological disorder.

PC203 Pre-Existing Psychosocial Problem

Pre-existing Psychosocial Problem is a factor when a qualified professional determines the individual met Diagnostic and Statistical Manual criteria for a psychosocial problem.

PC204 Emotional State

Emotional State is a factor when the individual is under the influence of a strong positive or negative emotion and that emotion interferes with duties.

PC205 Personality Style

Personality style is a factor when the individual's personal interaction with others creates an unsafe situation. Examples are authoritarian, over-conservative, impulsive, invulnerable, submissive or other personality traits that result in degraded crew performance.

PC206 Overconfidence

Overconfidence is a factor when the individual overvalues or overestimates personal capability, the capability of others or the capability of aircraft/vehicles or equipment and this creates an unsafe situation.

PC207 Pressing

Pressing is a factor when the individual knowingly commits to a course of action that presses them and/or their equipment beyond reasonable limits.

PC208 Complacency

Complacency is a factor when the individual's state of reduced conscious attention due to an attitude of overconfidence, undermotivation or the sense that others "have the situation under control" leads to an unsafe situation.

PC209 Inadequate Motivation

Motivation – Inadequate is a factor when the individual's motivation to accomplish a task or mission is weak or indecisive.

PC210 Misplaced Motivation

Misplaced Motivation is a factor when an individual or unit replaces the primary goal of a mission with a personal goal.

PC211 Overaggressive

Overaggressive is a factor when an individual or crew is excessive in the manner in which they conduct a mission.

PC212 Excessive Motivation to Succeed

Motivation to Succeed – Excessive is a factor when the individual is preoccupied with success to the exclusion of other mission factors leading to an unsafe situation.

PC213 Get-Home-Itis/Get-There-Itis

Get-Home-Itis/Get-There-Itis is a factor when an individual or crew is motivated to complete a mission or reach a destination for personal reasons, thereby short cutting necessary procedures or exercising poor judgment, leading to an unsafe situation.

PC214 Response Set

Response set is a factor when the individual has a cognitive or mental framework of expectations that predispose them to a certain *course of action* regardless of other cues.

PC215 Motivational Exhaustion (Burnout)

Motivational Exhaustion (Burnout) is a factor when the individual has the type of exhaustion associated with the wearing effects of high operations and personal tempo where their operational requirements impinge on their ability to satisfy their personal requirements and leads to degraded cognitive or operational capability.

Adverse Physiological States (PC3xx)

Are factors when an individual experiences a physiologic event that compromises human performance and this decreases performance and results in an unsafe situation.

PC301 Effects of G Forces (G-LOC, etc)

Effects of G Forces (G-LOC, etc) is a factor when the individual experiences G-induced loss of consciousness (GLOC), greyout, blackout or other neuro-circulatory affects of sustained acceleration forces.

PC302 Prescribed Drugs

Prescribed Drugs is a factor when the individual uses a prescribed drug with measurable effect interfering with performance.

PC303 Operational Injury/Illness

Operational Injury/Illness is a factor when an injury is sustained or illness develops from the operational environment or *during* the mission and this injury or illness results in an unsafe situation. This includes toxic exposure. Details of injury, illness or toxic exposure should be captured in the medical investigation. Do not use this code to capture injury or illness that does not cause an unsafe situation or contribute to the mishap sequence.

PC304 Sudden Incapacitation/Unconsciousness

Sudden Incapacitation/Unconsciousness is a factor when the individual has an abrupt loss of functional capacity / conscious awareness. (NOT GLOC) Capture medical causes for the incapacitation in the AFSAS medical module.

PC305 Pre-Existing Physical Illness/Injury/Deficit

Pre-Existing Physical Illness/Injury/Deficit is a factor when a physical illness, injury or deficit that existed at the time the individual boarded the aircraft or began the mission/task causes an unsafe situation. This includes situations where wavered physical defects contribute to an unsafe situation and situations where vision deficit or loss of prosthetic devices during the mission cause an unsafe situation. An individual must board the aircraft or begin the mission/task with prior knowledge of illness/injury/deficit otherwise mark and rate PC303. Details of injury, illness or

deficit should be captured in the medical investigation. Do not use this code to capture injury or illness that does not cause an unsafe situation or contribute to the mishap sequence. (i.e. medevac patient whose condition deteriorates during flight).

PC306 Physical Fatigue (Overexertion)

Physical Fatigue (Overexertion) is a factor when the individual's diminished physical capability is due to overuse (time/relative load) and it degrades task performance. (The

effects of prolonged physical activity, or the effects of brief but relatively extreme physical activity, either of which taxes a person's physical endurance or strength beyond the individual's normal limits.)

PC307 Fatigue - Physiological/Mental

Fatigue - Physiological/Mental is a factor when the individual's diminished physical or mental capability is due to an inadequate recovery, as a result of restricted or shortened sleep or physical or mental activity during prolonged wakefulness. Fatigue may additionally be described as acute, cumulative or chronic.

PC308 Circadian Rhythm Desynchrony

Circadian Rhythm Desynchrony is a factor when the individual's normal, 24-hour rhythmic biological cycle (circadian rhythm) is disturbed and it degrades task performance. This is caused typically by night work or rapid movement (such as one time zone per hour) across several time zones. Referred to as "shift lag" and "jet lag." (Time in the new time zone will lead to adaptation and recovery; the amount of time depends on the number of time zones crossed and the direction of travel. Recovery from shift lag may never occur.)

PC309 Motion Sickness

Motion Sickness is a factor when the symptoms of motion sickness impair normal performance. Motion sickness symptoms include nausea, sweating, flushing, vertigo, headache, stomach awareness, malaise, and vomiting.

PC310 Trapped Gas Disorders

Trapped Gas Disorders are a factor when gasses in the middle ear, sinuses, teeth, or intestinal tract expand or contract on ascent or descent causing an unsafe situation. Also capture alternobaric vertigo under this code. If the alternobaric vertigo induces spatial disorientation you must mark and rate PC508, PC509 or PC510.

PC311 Evolved Gas Disorders

Evolved gas disorders are a factor when inert-gas evolves in the blood causing an unsafe situation. This includes, chokes, CNS, bends or parasthesias or other conditions caused by inert-gas evolution.

PC312 Hypoxia

Hypoxia is a factor when the individual has insufficient oxygen supply to the body sufficient to cause an impairment of function.

PC313 Hyperventilation

Hyperventilation is a factor when the effect of ventilating above the physiological demands of the body causes the individual's performance capabilities to be degraded.

PC314 Visual Adaptation

Visual Adaptation is a factor when the normal human limitation of dark-adaptation rate affects safety, for example, when transitioning between aided and unaided night vision.

PC315 Dehydration

Dehydration is a factor when the performance of the operator is degraded due to dehydration as a result of excessive fluid losses due to heat stress or due to insufficient fluid intake.

PC316 Physical Task Oversaturation

Physical Task Oversaturation is a factor when the number or complexity of manual tasks in a compressed time period exceeds an individual's capacity to perform.

Physical/Mental Limitations (PC4xx)

Are factors in a mishap when an individual, temporarily or permanently lacks the physical or mental capabilities to cope with a situation and this insufficiency causes an unsafe situation.

PC401 Learning Ability/Rate

Learning Ability – Rate is a factor when the individual's relative efficiency with which new information is acquired, and relatively permanent adjustments made in behavior or thinking, are not consistent with mission demands.

PC402 Memory Ability/Lapses

Memory Ability/Lapses is a factor when the individual is unable or has lapses in the ability to recall past experience needed for safe mission completion. (Experience includes any information a person receives through any means, any cognitive functions he or she performed on that information, and any response he or she made as a result of it.)

PC403 Anthropometric/Biomechanical Limitations

Anthropometric/Biomechanical limitations are a factor when the size, strength, dexterity, mobility or other biomechanical limitations of an individual creates an unsafe situation. It must be expected that the average individual qualified for that duty position could accomplish the task in question.

PC404 Motor Skill/Coordination or Timing Deficiency

Motor Skill/Coordination or Timing Deficiency is a factor when the individual lacks the required psychomotor skills, coordination or timing skills necessary to accomplish the task attempted.

PC405 Technical/Procedural Knowledge

Technical/Procedural Knowledge is a factor when an individual was adequately exposed to the information needed to perform the mission element but did not absorb it. Lack of knowledge implies no deficiency in the training program, but rather the failure of the individual to absorb or retain the information. (Exposure to information at a point in the past does not imply "knowledge" of it.)

Perceptual Factors (PC5xx)

Are factors in a mishap when misperception of an object, threat or situation, (visual, auditory, proprioceptive, or vestibular conditions) creates an unsafe situation.

PC501 Illusion – Kinesthetic

Illusion – Kinesthetic is a factor when somatosensory stimuli of the ligaments, muscles, or joints cause the individual to have an erroneous perception of orientation, motion or acceleration leading to degraded performance. (If this illusion leads to spatial disorientation you must mark and rate PC508, PC509 or PC510.)

PC502 Illusion – Vestibular

Illusion – Vestibular is a factor when stimuli acting on the semicircular ducts or otolith organs of the vestibular apparatus cause the individual to have an erroneous perception of orientation, motion or acceleration leading to degraded performance. (If this illusion leads to spatial disorientation you must mark and rate PC508, PC509 or PC510.)

PC503 Illusion – Visual

Illusion – Visual is a factor when visual stimuli result in an erroneous perception of orientation, motion or acceleration, leading to degraded performance. (If this illusion leads to spatial disorientation you must mark and rate PC508, PC509 or PC510.)

PC504 Misperception of Operational Conditions

Misperception of Operational Conditions is a factor when an individual misperceives or misjudges altitude, separation, speed, closure rate, road/sea conditions, aircraft/vehicle location within the performance envelope or other operational conditions and this leads to an unsafe situation.

PC505 Misinterpreted/Misread Instrument

Misinterpreted/Misread Instrument is a factor when the individual is presented with a correct instrument reading but its significance is not recognized, it is misread or is misinterpreted.

PC506 Expectancy

Expectancy is a factor when the individual's expects to perceive a certain reality and those expectations are strong enough to create a *false perception* of the expectation.

PC507 Auditory Cues

Auditory Cues is a factor when the auditory inputs are correctly interpreted but are misleading or disorienting. Also when the inputs are incorrectly interpreted and cause an impairment of normal performance.

PC508 Spatial Disorientation (Type 1) Unrecognized

Spatial Disorientation is a failure to correctly sense a position, motion or attitude of the aircraft or of oneself within the fixed coordinate system provided by the surface of the earth and the gravitational vertical. Spatial Disorientation (Type 1) Unrecognized is a factor when a person's cognitive awareness of one or more of the following varies from reality: attitude; position; velocity; direction of motion or acceleration. Proper control inputs are not made because the need is unknown.

PC509 Spatial Disorientation (Type 2) Recognized

Spatial Disorientation is a failure to correctly sense a position, motion or attitude of the aircraft or of oneself within the fixed coordinate system provided by the surface of the earth and the gravitational vertical. Spatial Disorientation (Type 2) is a factor when recognized perceptual confusion is induced through one or more of the following senses: visual; vestibular; auditory; tactile; proprioception or kinesthetic. Proper control inputs are still possible.

PC510 Spatial Disorientation (Type 3) Incapacitating

Spatial Disorientation is a failure to correctly sense a position, motion or attitude of the aircraft or of oneself within the fixed coordinate system provided by the surface of the earth and the gravitational vertical. Spatial Disorientation (Type 3) Incapacitating is a factor when an individual is unable to make proper control inputs for safe operation of the aircraft or system due to a conflict (often extreme) between the sensory systems identified in type 2.

PC511 Temporal Distortion

Temporal Distortion is a factor when the individual experiences a compression or expansion of time relative to reality leading to an unsafe situation. (Often associated with a "fight or flight" response.)

Personnel Factors (PPxxx)

Are factors in a mishap if self imposed stressors or crew resource management affect practices, conditions or actions of individuals and result in human error or an unsafe situation.

Coordination/Communication/Planning Factors(PP1xx)

Refer to interactions among individuals, crews, and teams involved with the preparation and execution of a mission that resulted in human error or an unsafe situation.

PP101 Crew/Team Leadership

Crew/Team Leadership is a factor when the crew/team leadership techniques failed to facilitate a proper crew climate, to include establishing and maintaining an accurate and shared understanding of the evolving mission and plan on the part of all crew or team members.

PP102 Cross-Monitoring Performance

Cross-monitoring performance is a factor when crew or team members failed to monitor, assist or back-up each other's actions and decisions.

PP103 Task Delegation

Task delegation is a factor when the crew or team members failed to actively manage the distribution of mission tasks to prevent the overloading of any crewmember.

PP104 Rank/Position Authority Gradient

Rank/position authority gradient is a factor when the differences in rank of the team, crew or flight caused the mission performance capabilities to be degraded. Also conditions where formal or informal authority gradient is too steep or too flat across a crew, team or flight and this condition degrades collective or individual performance.

PP105 Assertiveness

Assertiveness is a factor when individuals failed to state critical information or solutions with appropriate persistence.

PP106 Communicating Critical Information

Communicating critical information is a factor when known critical information was not provided to appropriate individuals in an accurate or timely manner.

PP107 Standard/Proper Terminology

Standard/proper terminology is a factor when clear and concise terms, phrases hand signals, etc per service standards and training were not used.

PP108 Challenge and Reply

Challenge and reply is a factor when communications did not include supportive feedback or acknowledgement to ensure that personnel correctly understand announcements or directives.

PP109 Mission Planning

Mission planning is a factor when an individual, crew or team failed to complete all preparatory tasks associated with planning the mission, resulting in an unsafe situation. Planning tasks

include information collection and analysis, coordinating activities within the crew or team and with appropriate external agencies, contingency planning, and risk assessment.

PP110 Mission Briefing

Mission briefing is a factor when information and instructions provided to individuals, crews, or teams were insufficient, or participants failed to discuss contingencies and strategies to cope with contingencies.

PP111 Task/Mission-In-Progress Re-Planning

Task/mission-in-progress re-planning is a factor when crew or team members fail to adequately reassess changes in their dynamic environment during mission execution and change their mission plan accordingly to ensure adequate management of risk.

PP112 Miscommunication

Miscommunication is a factor when correctly communicated information is misunderstood, misinterpreted, or disregarded.

Self-Imposed Stress (PP2xx)

Is a factor in a mishap if the operator demonstrates disregard for rules and instructions that govern the individuals readiness to perform, or exhibits poor judgment when it comes to readiness and results in human error or an unsafe situation.

PP201 Physical Fitness

Physical Fitness is a factor when the relative physical state of the individual, in terms of a regular rigorous exercise program or a physically active lifestyle, is not adequate to support mission demands.

PP202 Alcohol

Alcohol is a factor when the acute or residual effects of alcohol impaired performance or created an unsafe situation.

PP203 Drugs/Supplements/Self medication

Drugs/Supplements/Self-medication is a factor when the individual takes any drug, other than prescribed, that interferes with performance. This includes nicotine or caffeine in sufficient quantities to cause impairment of normal function. This also includes any chemical compound taken for purposes of prevention of disease, treatment of disease, weight management, mood alteration, birth control or sleep management, etc. The effects may be direct or residual. Alcohol is captured under PP206.

PP204 Nutrition

Nutrition is a factor when the individual’s nutritional state or poor dietary practices are inadequate to fuel the brain and body functions resulting in degraded performance

PP205 Inadequate Rest

Inadequate rest is a factor when the opportunity for rest was provided but the individual failed to take the opportunity to rest.

PP206 Unreported Disqualifying Medical Condition

Unreported Disqualifying Medical Condition is a factor when the operator intentionally operates/flies with a known disqualifying medical condition that results in an unsafe situation.

Supervision

Is a factor in a mishap if the methods, decisions or policies of the supervisory chain of command directly affect practices, conditions, or actions of individual and result in human error or an unsafe situation.

Inadequate Supervision (SIxxx)

Is a factor in a mishap when supervision proves inappropriate or improper and fails to identify hazard, recognize and control risk, provide guidance, training and/or oversight and results in human error or an unsafe situation.

SI001 Leadership/Supervision/Oversight Inadequate

Leadership/Supervision/Oversight Inadequate is a factor when the availability, competency, quality or timeliness of leadership, supervision or oversight does not meet task demands and creates an unsafe situation. Inappropriate supervisory pressures are also captured under this code.

SI002 Supervision – Modeling

Supervision – Modeling is a factor when the individual's learning is influenced by the behavior of peers and supervisors and when that learning manifests itself in actions that are either inappropriate to the individual's skill level or violate standard procedures and lead to an unsafe situation.

SI003 Local Training Issues/Programs

Local Training Issues/Programs are a factor when one-time or recurrent training programs, upgrade programs, transition programs or any other local training is inadequate or unavailable (etc) and this creates an unsafe situation. (Note: the failure of an individual to absorb the training material in an adequate training program does not indicate a training program problem. Capture these factors under PC401 "Learning ability/rate" or PC405 "Technical/Procedural Knowledge." The failure of an individual to recall learned information under stress or while fatigued despite attending an adequate training program does not indicate a training program problem. Capture these factors under PC402 "Memory/ Ability lapses" or other cognitive factors such as PC104 "Confusion," PC106 "Distraction," PC105 "Negative Transfer," etc.)

SI004 Supervision – Policy

Supervision – Policy is a factor when policy or guidance or lack of a policy or guidance leads to an unsafe situation.

SI005 Supervision – Personality Conflict

Supervision – Personality Conflict is a factor when a supervisor and individual member experience a "personality conflict" that leads to a dangerous error in judgment / action.

SI006 Supervision – Lack of Feedback

Supervision – Lack of Feedback is a factor when information critical to a potential safety issue had been provided to supervisory or management personnel without feedback to the source (failure to close the loop).

Planned Inappropriate Operations (SPxxx)

Is a factor in a mishap when supervision fails to adequately assess the hazards associated with an operation and allows for unnecessary risk. It is also a factor when supervision allows non-proficient or inexperienced personnel to attempt missions beyond their capability or when crew or flight makeup is inappropriate for the task or mission.

SP001 Ordered/Led on Mission Beyond Capability

Ordered/Led on Mission Beyond Capability is a factor when supervisor / management directs personnel to undertake a mission beyond their skill level or beyond the capabilities of their equipment.

SP002 Crew/Team/Flight Makeup/Composition

Crew/Team/Flight Makeup/Composition is a factor when, in the opinion of the investigator, the makeup of the crew or of the flight should have reasonably raised obvious safety concerns in the minds of crewmembers involved in the mission, or in any other individual directly related to the scheduling of this mission.

SP003 Limited Recent Experience

Limited Recent Experience is a factor when the supervisor selects an individual who’s experience for either a specific maneuver, event or scenario is not sufficiently current to permit safe mission execution.

SP004 Limited Total Experience

Limited Total Experience is a factor when a supervisor selects an individual who’s individual has performed a maneuver, or participated in a specific scenario, infrequently or rarely.

SP005 Proficiency

Proficiency is a factor when and individual is not proficient in a task, mission or event.

SP006 Risk Assessment – Formal

Risk Assessment – Formal is a factor when supervision does not adequately evaluate the risks associated with a mission or when pre-mission risk assessment tools or risk assessment programs are inadequate.

SP007 Authorized Unnecessary Hazard

Authorized Unnecessary Hazard is a factor when supervision authorizes a mission or mission element that is unnecessarily hazardous without sufficient cause or need. Includes intentionally scheduling personnel for mission or operation that they are not qualified to perform.

Failure to Correct Known Problem (SFxxx)

Is a factor in a mishap when supervision fails to correct known deficiencies in documents, processes or procedures, or fails to correct inappropriate or unsafe actions of individuals, and this lack of supervisory action creates an unsafe situation.

SF001 – Personnel Management

Personnel management is a factor when a supervisor fails to identify an operator or aviator who exhibits recognizable risky behaviors or unsafe tendencies or fails to institute remedial actions when an individual is identified with risky behaviors or unsafe tendencies.

SF002 – Operations Management

Operations management is a factor when a supervisor fails to correct known hazardous practices, conditions or guidance that allows for hazardous practices within the scope of his/her command

Supervisory Violations (SVxxx)

Is a factor in a mishap when supervision while managing organizational assets willfully disregards instructions, guidance, rules, or operating instructions and this lack of supervisory responsibility creates an unsafe situation.

SV001 Supervision – Discipline Enforcement (Supervisory act of omission)

Supervision – Discipline Enforcement is a factor when unit (organizational) and operating rules have not been enforced by the normally constituted authority.

SV002 Supervision – Defacto Policy

Supervision – Defacto Policy is a factor when unwritten or “unofficial” policy perceived and followed by the individual, which has not been formally established by the properly constituted authority, leads to an unsafe situation.

SV003 Directed Violation

Directed Violation is a factor when a supervisor directs a subordinate to violate existing regulations, instructions or technical guidance.

SV004 Currency

Currency is a factor when an individual has not met the general training requirements for his job/weapon system and is considered “non-current” and supervision/leadership inappropriately allows the individual to perform the mission element for which the individual is non-current.

Organizational Influences

Are factors in a mishap if the communications, actions, omissions or policies of upper-level management directly or indirectly affect supervisory practices, conditions or actions of the operator(s) and result in system failure, human error or an unsafe situation.

Resource/Acquisition Management (ORxxx)

Is a factor in a mishap if resource management and/or acquisition processes or policies, directly or indirectly, influence system safety and results in poor error management or creates an unsafe situation.

OR001 Air Traffic Control Resources

Air Traffic Control Resources is a factor when inadequate monitoring of airspace, enroute nav-aids or language barriers in air traffic controllers cause an unsafe situation. Note: If the unsafe acts of an individual air traffic controller are determined to be a factor in a mishap then the controller must be added and investigated as a mishap person.

OR002 Airfield Resources

Airfield Resources are a factor when runways, taxiways, ramps, terminal ATC resources or nav-aids, lighting systems, SOF/RSU resources or the environment surrounding the airfield are inadequate or unsafe. If the airfield or environment created a visual illusion that contributed to the mishap sequence you must also mark and rate PC503 “Illusion - Visual.”

OR003 Operator Support

Operator Support is a factor when support facilities (dining, exercise, quarters, medical care, etc) or opportunity for recreation or rest are not available or adequate and this creates an unsafe situation. This includes situations where leave is not taken for reasons other than the individual’s choice.

OR004 Acquisition Policies/Design Processes

Acquisition Policies/Design Processes is a factor when the processes through which aircraft, vehicle, equipment or logistical support are acquired allows inadequacies or when design deficiencies allow inadequacies in the acquisition and the inadequacies create an unsafe situation.

OR005 Attrition Policies

Attrition Policies is a factor when the process through which equipment is removed from service is inadequate and this inadequacy creates an unsafe situation**.**

OR006 Accession/Selection Policies

Accession/Selection Policies is a factor when the process through which individuals are screened, brought into the service or placed into specialties is inadequate and creates an unsafe situation.

OR007 Personnel Resources

Personnel Resources is a factor when the process through which manning, staffing or personnel placement or manning resource allocations are inadequate for mission demands and the inadequacy causes an unsafe situation.

OR008 Informational Resources/Support

Informational Resources/Support is a factor when weather, intelligence, operational planning material or other information necessary for safe operations planning are not available.

OR009 Financial Resources/Support

Financial Resources/Support is a factor when an organization or operation does not receive the financial resources to complete its assigned mission and this deficiency creates an unsafe situation.

Organizational Climate (OCxxx)

Is a factor in a mishap if organizational variables including environment, structure, policies, and culture influence individual actions and results in human error or an unsafe situation.

OC001 Unit/Organizational Values/Culture

Unit/Organizational Values/Culture is a factor when explicit/implicit actions, statements or attitudes of unit leadership set unit/organizational values (culture) that allow an environment where unsafe mission demands or pressures exist.

OC002 Evaluation/Promotion/Upgrade

Evaluation/Promotion/Upgrade is a factor when an individual perceives that their performance on a task will inappropriately impact an evaluation, promotion or opportunity for upgrade and this pressure creates an unsafe situation. Other inappropriate supervisory pressures are captured under SI001 Supervision – Inadequate.

OC003 Perceptions of Equipment

Perceptions of Equipment is a factor when over or under confidence in an aircraft, vehicle, device, system or any other equipment creates an unsafe situation.

OC004 Unit Mission/Aircraft/Vehicle/Equipment Change or Unit Deactivation

Unit Mission/Aircraft/Vehicle/Equipment Change or Unit Deactivation is a factor when the process of changing missions/aircraft/vehicle/equipment or an impending unit deactivation creates an unsafe situation.

OC005 Organizational Structure

Organizational Structure is a factor when the chain of command of an individual or structure of an organization is confusing, non-standard or inadequate and this creates an unsafe situation.

Organizational Processes (OPxxx)

Is a factor in a mishap if organizational processes such as operations, procedures, operational risk management and oversight negatively influence individual, supervisory, and/or organizational performance and results in unrecognized hazards and/or uncontrolled risk and leads to human error or an unsafe situation.

OP001 Ops Tempo/Workload

Ops Tempo/Workload is a factor when the pace of deployments, workload, additional duties, off-duty education, PME, or other workload-inducing condition of an individual or unit creates an unsafe situation.

OP002 Program and Policy Risk Assessment

Program and Policy Risk Assessment is a factor when the potential risks of a large program, operation, acquisition or process are not adequately assessed and this inadequacy leads to an unsafe situation.

OP003 Procedural Guidance/Publications

Procedural Guidance/Publications is a factor when written direction, checklists, graphic depictions, tables, charts or other published guidance is inadequate, misleading or inappropriate and this creates an unsafe situation.

OP004 Organizational Training Issues/Programs

Organizational Training Issues/Programs are a factor when one-time or initial training programs, upgrade programs, transition programs or other training that is conducted outside the local unit is inadequate or unavailable (etc) and this creates an unsafe situation. (Note: the failure of an individual to absorb the training material in an adequate training program does not indicate a training program problem. Capture these factors under PC401 “Learning Ability/Rate” or PC405 “Technical/Procedural Knowledge.” The failure of an individual to recall learned information under stress or while fatigued despite attending an adequate training program does not indicate a training program problem. Capture these factors under PC402 “Memory/ Ability lapses” or other cognitive factors such as PC104 “Confusion,” PC106 “Distraction,” PC105 “Negative Transfer” or one of the forms of Fatigue, etc.)

OP005 Doctrine

Doctrine is a factor when the doctrine, philosophy or concept of operations in an organization is flawed or accepts unnecessary risk and this flaw or risk acceptance leads to an unsafe situation or uncontrolled hazard.

OP006 Program Oversight/Program Management

Program Oversight/Program Management is a factor when programs are implemented without sufficient support, oversight or planning and this leads to an unsafe situation.

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